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ASSESSMENT OF IN SITU COAL RESOURCES

Wood Mountain Coalfield, Saskatchewan

Á. Füstös, P. Eng.
Ore Reserves Assessment Group

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SUMMARY

Reserves and resources of recoverable coal in the Wood Mountain Coalfield of southern Saskatchewan were assessed by the Ore Reserves Assessment Group in 1985. These reserve and resource quantities are tabulated below:

MEASURED *(Million Tonnes)*	INDICATED *(Million Tonnes)*	INFERRED *(Million Tonnes)*
	972.3	153

The results are essentially the same as the results of the GSC 1978 estimation of the *in situ* coal resources of the Wood Mountain Coalfield.

The fact that independently the 1978 GSC and 1986 ORAG estimations produced essentially the same results, reinforces the validity of both estimations.

EXPLANATORY STATEMENT

The contents of the present report are identical with the ERP/MRL 85-133(TR) DIVISION REPORT, entitled:

ASSESSMENT OF RECOVERABLE COAL RESERVES
Wood Mountain Coalfield, Saskatchewan

by A. Boyer, D. Walsh and R. Boyle of the Ore Reserves Assessment Group. The sole difference is that in the present report an *in situ* lignite density factor of 1.24 was used to calculate the weight of the estimated volume of the coal resources.

In 1978 the Geological Survey of Canada completed an estimation of the *in situ* coal resources of all four coalfields of southern Saskatchewan and published an extensive and explicit report on the subject (Ref. 2). Using the data on which the GSC report was based, as well as additional information collected subsequently from the Saskatchewan Power Authority, the Ore Reserves Assessment Group of CANMET estimated the *recoverable* coal resources from three of the four coalfields since 1982. The cardinal purpose of these exercises was to establish how much coal could be recovered from the coalfields by open pit mining methods.

In its estimations ORAG applied some assumed restrictive criteria of mineability, in order to quantitatively differenciate between *in situ* and *mineable* coal. This was required because recoverability factors based on sustained mining using specific mining methods was not available either for the entire southern Saskatchewan region coalfields or the four coalfields of particular interest.

To overcome this basic stumbling block to its efforts of estimation of *recoverable* coal resources in southern Saskatchewan, ORAG devised, on the insistence of the staff of the Saskatchewan Power Authority, a **density-volume factor.** This factor considers the assumed *in situ* density of lignite, which has not changed since the compilation of the original GSC report, (Ref. 2), and the data about the water content of the coal in various coalfields of the area. These latter data were supplied to ORAG by the Saskatchewan Power Authority. The derivation of the **density-volume factor** is described in detail in APPENDIX 2 of ERP/MRL 85-133(TR) DIVISION REPORT.

Density-volume factors were derived and used to date for estimations of *recoverable* coal in three coalfields of southern Saskatchewan (Refs. 7, 8 & 10).

The present report was compiled to illustrate the difference between *in situ* and *recoverable* coal resources in the Wood Mountain Coalfield, Saskatchewan.

TABLE 1(a)
SUMMARY OF IN SITU COAL RESERVES
WOOD MOUNTAIN COALFIELD

Coal Zone	Measured *(Million Tonnes)*	Indicated *(Million Tonnes)*	Total *(Million Tonnes)*
Quantock		30.8	30.8
Willowvale		19.8	19.8
Rockglen		290.5	290.5
Borderland		447.7	447.7
Stonehenge		114.5	114.5
Killdeer		69.0	69.0
TOTAL:		972.3	972.3

TABLE 1(b)
SUMMARY OF IN SITU COAL RESERVES AND RESOURCES
WOOD MOUNTAIN COALFIELD

Coal Zone	Measured *(Million Tonnes)*	Indicated *(Million Tonnes)*	Inferred *(Million Tonnes)*
Quantock		30.8	4
Willowvale		19.8	16
Rockglen		290.5	15
Borderland		447.7	38
Stonehenge		114.5	38
Killdeer		69.0	42
TOTAL:		972.3	153

TABLE 2
DETAILED IN SITU COAL RESERVES
Wood Mountain Coalfield

Quantock Coal Zone

Surface Identification	Surface ($\times 10^6$ m^2)	Thickness (*meters*)	Volume ($\times 10^6$ m^3)	Tonnage ($\times 10^6$ *Tonnes*)
IA-01	11.61	0.97	11.26	13.96
IA-02	5.64	0.47	2.65	3.29
IA-03	10.17	0.55	5.59	6.93
IA-04	5.17	0.31	1.60	1.98
IA-05	1.77	0.68	1.20	1.49
IA-06	2.54	0.31	0.79	0.98
IA-07	2.89	0.62	1.79	2.22
NA-01	2.98	0.83	2.47	3.06
NA-02	2.32	0.47	1.09	1.36

TABLE 3
DETAILED IN SITU COAL RESERVES
Wood Mountain Coalfield

Willowvale Coal Zone

Surface Identification	Surface ($\times 10^6$ m^2)	Thickness (*meters*)	Volume ($\times 10^6$ m^3)	Tonnage ($\times 10^6$ *Tonnes*)
IB-01	1.36	0.31	0.42	0.53
IB-02	2.56	0.16	0.41	0.51
IB-03	2.92	0.54	1.58	1.95
IB-04	10.40	0.42	4.38	5.43
IB-05	2.56	0.92	2.35	2.92
IB-06	2.56	0.76	1.94	2.41
IB-07	4.50	0.77	3.47	4.30
IB-08	2.56	0.31	0.80	0.99
IB-09	3.66	0.16	0.59	0.73
NB-01	1.55	0.24	0.38	0.47
NB-02	2.25	0.54	1.21	1.50
NB-03	2.14	0.54	1.15	1.43
NB-04	3.90	0.92	3.59	4.45
NB-05	3.88	0.84	3.26	4.04
NB-06	3.90	0.77	3.00	3.72

TABLE 4
DETAILED IN SITU COAL RESERVES
Wood Mountain Coalfield

Rockglen Coal Zone

Surface Identification	Surface ($\times 10^6$ m^2)	Thickness (*meters*)	Volume ($\times 10^6$ m^3)	Tonnage ($\times 10^6$ *Tonnes*)
IC-01	11.01	0.34	3.74	4.64
IC-02	58.44	1.01	59.02	73.19
IC-03	2.56	1.07	2.74	3.40
IC-04	97.15	1.69	164.19	203.59
IC-05	6.47	0.71	4.59	5.69
NC-01	3.85	0.34	1.31	1.62
NC-02	3.14	1.01	3.18	3.94
NC-03	2.37	1.01	2.39	2.96
NC-04	3.40	1.01	3.44	4.26
NC-05	1.50	1.07	1.60	1.98

TABLE 5
DETAILED IN SITU COAL RESERVES
Wood Mountain Coalfield

Borderland Coal Zone

Surface Identification	Surface ($\times 10^6$ m^2)	Thickness (*meters*)	Volume ($\times 10^6$ m^3)	Tonnage ($\times 10^6$ *Tonnes*)
ID-01	107.68	2.04	219.67	272.39
ID-03	18.10	1.28	23.16	28.72
ID-04	54.63	1.84	100.52	124.64
ID-05	1.99	0.73	1.45	1.79
ID-06	5.09	0.38	1.93	2.39
ID-07	6.18	2.31	14.27	17.70
ND-01	1.56	2.04	3.19	3.95
ND-03	13.79	1.28	17.65	21.88
ND-04	5.04	1.84	9.27	11.50

TABLE 6
DETAILED IN SITU COAL RESERVES
Wood Mountain Coalfield

Stonehenge Coal Zone

Surface Identification	Surface ($\times 10^6$ m^2)	Thickness (*meters*)	Volume ($\times 10^6$ m^3)	Tonnage ($\times 10^6$ *Tonnes*)
IE-01	4.53	0.74	3.35	4.16
IE-02	8.21	1.30	10.67	13.23
IE-03	48.21	1.50	72.32	89.67
IE-04	3.00	2.01	6.04	7.48
NE-01	15.17	1.20	18.20	22.57
NE-02	8.42	1.50	12.64	15.67

TABLE 7
DETAILED IN SITU COAL RESERVES
Wood Mountain Coalfield

Kildeer Coal Zone

Surface Identification	Surface ($\times 10^6$ m^2)	Thickness (*meters*)	Volume ($\times 10^6$ m^3)	Tonnage ($\times 10^6$ *Tonnes*)
IF-01	4.23	0.76	3.21	3.98
IF-02	2.42	2.42	5.86	7.27
IF-03	18.11	0.85	15.39	19.08
IF-04	1.62	0.92	1.49	1.85
IF-05	10.56	2.02	21.33	26.45
IF-06	1.59	2.02	3.21	3.98
IF-07	0.77	0.31	0.24	0.29
IF-08	4.04	1.22	4.93	6.11
NF-01	26.94	1.03	27.75	34.41
NF-02	2.32	0.31	0.72	0.89
NF-03	0.73	1.22	0.89	1.11
NF-04	4.14	1.22	5.05	6.26

TABLE 8
COMPARISON OF THE PRESENT AND THE PREVIOUS COAL RESERVE/RESOURCE ESTIMATIONS
Wood Mountain Coalfield

Coal Zone	Estimation Sources	Resource Categories in Million Tonnes			
		Measured	Indicated	Total M&I	Inferred
Quantock	GSC/1978	4.35	8.7	13.1	23
	ORAG/1985		30.8	30.8	4
Willowvale	GSC/1978	8.26	17.7	26.0	26
	ORAG/1985		19.8	19.8	16
Rockglen	GSC/1978	92.67	241.9	334.6	245
	ORAG/1985		290.5	290.5	15
Borderland	GSC/1978	116.71	298.6	415.3	440
	ORAG/1985		447.7	447.7	38
Stonehenge	GSC/1978	36.83	114.7	151.5	203
	ORAG/1985		114.5	114.5	38
Killdeer	GSC/1978	18.55	51.6	70.2	178
	ORAG/1985		69.0	69.0	42
All Zones	GSC 1978	277.37	733.2	1010.7	1115
	ORAG 1985		972.3	972.3	153
Difference	ORAG85/GSC78	-277.37	+239.1	-38.4	- 962

Notes:
1; *GSC/78 from TABLE 12 REPORT 30 with metric conversion by D.F.W.*
2; *ORAG/85 calculations by A.B, R.B. and D.F.W. from ORAG data files*
3; *No deduction has been made for railway, transmission line and road allowances.*

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